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## The USENIX Association Newsletter

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Volume 14, Number 3

May/June 1989

### CONTENTS

Au revoir and Hello .....	3
USENIX 1989 Summer Conference Tutorials .....	4
Call for Papers: Large Installation Systems Administration Workshop .....	6
Call for Papers: Distributed and Multiprocessor Systems Workshop .....	7
Call for Papers: Computer Graphics Workshop .....	8
Call for Papers: Winter 1990 USENIX Conference .....	9
AUUG '89 Conference and Exhibition .....	10
USENIX C++ Workshop .....	11
Nominating Committee Formed .....	11
The UK UNIX systems User Group .....	12
UNIX Users Meeting Agenda .....	13
Book Review: Learning the vi Editor .....	14
<i>Peter H. Salus</i>	
Long-Term Calendar of UNIX Events .....	15
USENIX Association Financial Statements .....	16
An Update on UNIX Standards Activities .....	18
Publications Order Form .....	23
Proceedings Subscription Form .....	24
2.10.1BSD Release Available .....	25
Final Printing of 4.3BSD Manuals .....	26
4.3BSD Manual Reproduction Authorization and Order Form .....	27
Obtaining GNU Software .....	28
GNU Software Order Form .....	29
Local User Groups .....	30

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The closing date for submissions for the next issue of *;login:* is June 30, 1989



THE PROFESSIONAL AND TECHNICAL  
UNIX® ASSOCIATION

## NOTICE

*login:* is the official newsletter of the USENIX Association, and is sent free of charge to all members of the Association.

The USENIX Association is an organization of AT&T licensees, sub-licensees, and other persons formed for the purpose of exchanging information and ideas about UNIX<sup>†</sup> and similar operating systems and the C programming language. It is a non-profit corporation incorporated under the laws of the State of Delaware. The officers of the Association are:

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### Contributions Solicited

Members of the UNIX community are encouraged to contribute articles to *login:*. Contributions may be sent to the editors electronically at the addresses above or through the U.S. mail to the Association office. The USENIX Association reserves the right to edit submitted material.

*login:* is produced on UNIX systems using *troff* and a variation of the *-me* macros. Contributions should be in *n/troff* input format, using any macro package.

### UUNET Subscriptions

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### Acknowledgments

The Association uses a SUN<sup>‡</sup> 3/180S running SUN OS for support of office and membership functions, preparation of *login:*, and other Association activities. Connected to the SUN is a QMS Lasergrafix\* 800 Printer System donated by Quality Micro Systems of Mobile, Alabama. It is used for general printing and draft production of *login:* and *Computing Systems* with *ditroff* software provided by mt Xinu. The membership and mailing lists are maintained using Sybase.#

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## Au revoir and Hello

As most of you who have read *comp.org.usenix* know, I have resigned from my post as Executive Director of USENIX to return to the Northeast. By the time this is published, I will have assumed the post of Director of University and Government Relations with the Open Software Foundation in Cambridge.

I have enjoyed my three years as Executive Director tremendously: having been active in increasing the number of workshops; in getting the proceedings published; in setting up the scholarships has been very exciting. Even more rewarding has been my role as Managing Editor of *Computing Systems*. To my great pleasure, the USENIX Board and Mike O'Dell, the Editor-in-Chief, have asked me to continue in that role. I will also continue to participate in the complimentary tutorial on writing and submitting abstracts, papers and articles at forthcoming technical conferences.

There is no way that I can possibly thank the many USENIX members who have made my tenure pleasant: the

various Board members, the chairs of conferences, workshops, and committees; the authors of articles and reviews for the newsletter and the journal; have all treated the resident technical ignoramus with great tolerance. The USENIX staff, in all three offices, has made my job a pleasure.

I think it is important for me to say all this at the same time that I pass the baton to a new Executive Director: Ellie Young, who has served as my deputy since last summer, has been appointed by the Board. She came to USENIX after several years as the Journals Manager of the University of California Press, and will now be the one to suffer the tribulations of insufficient soda at tutorial breaks, election tallies, bizarre requests from members, Board minutes, and publishing proceedings and ;login:.

Mike O'Dell once wrote that my job was like herding cats: I'm sure Ellie will be a superb tamer of felines.

Peter H. Salus

# **USENIX 1989 Summer Conference Tutorials**

**June 12-16, 1989**

**Baltimore Convention Center**

**Baltimore, MD**

The tutorial program for the Summer Technical Conference and Vendor Exhibition is listed below. Complete descriptions of the individual tutorials, as well as the Conference agenda, registration information, etc., are contained in the registration packet (which was mailed on April 10). If you need another registration packet or further information, contact the USENIX Conference Office at the address below.

## **Monday, June 12, 1989**

### **Mach Overview**

Avadis Tevanian, NeXT, Inc.

### **Introduction To Programming the X Window Systems, Version 11**

Oliver Jones, Apollo Computer

### **An Introduction to C++**

Rob Murray, AT&T Bell Labs

### **Security Issues in a Distributed UNIX Environment: The Kerberos Approach**

Dan Geer, Jeff Schiller and Jon Rochlis, MIT

### **Performance Measurement Tools and Techniques Under UNIX System V**

Danny Chen and Ron Barkley, AT&T

### **Introduction to 4.3BSD Internals**

Tom Doeppner, Brown University

### **Introduction to UNIX System V Internals**

Steve Buroff, AT&T, and Curt Schimmel, Key Computer Lab

### **TCP/IP Performance Enhancements**

Mike Karels, UC Berkeley, and Van Jacobson, LBL

### **Designing and Maintaining a LAN**

Evi Nemeth, Bob Coggeshall and Trent Hahn, Univ. of Colorado

### **AIX Technology**

Charlie Sauer and Jack O'Quin, IBM

### **PostScript in the UNIX World**

Dick Dunn, Interactive Systems Corp.

### **UNIX System V Remote File Sharing (RFS)**

Mike Padovano and Mike Scheer, AT&T

### **UNIX Network Programming**

Richard Stevens, Health Institute International

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## **Tuesday, June 13, 1989**

**Mach Virtual Memory Internals**

Nawaf Bitar, Apollo Computer

**XToolkit Intrinsics**

Paul Kimball, DEC

**Using Advanced C++ Features**

Stanley Lippman, AT&T Bell Labs

**Network Computing System & Architecture:**

**Overview & Tutorial in Writing Distributed Applications**

Nathaniel Mishkin and Paul Leach, Apollo Computer

**Introduction to the Internals of the Gnu C Compiler (GCC)**

Richard Stallman, GNU Project

**Beyond 4.3BSD: Advanced Kernel Topics**

Mike Karels and Marshall Kirk McKusick, UC Berkeley

**Advanced UNIX System V Internals – A Code Walk Through**

Steve Buroff, AT&T, and Curt Schimmel, Key Computer Lab

**UNIX 4.xBSD Systems Administration**

Rob Kolstad, Prisma, Inc, and Evi Nemeth, Univ. of Colorado

**UNIX Device Driver Design (4.2/3BSD)**

Dan Klein, Software Engineering Institute

**Software Contracts and Intellectual Property**

Dan Appelman, Heller, Ehrman, White & McAuliffe

**Using the NeWS Window System**

David LaVallee and Owen Densmore, Sun Microsystems

**Writing Distributed Applications Using the ONC Platform**

John Corbin and Chris Silveri, Sun Microsystems

**Special Topics in C**

Carol Meier, API Ltd.

**For further information:**

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22672 Lambert Street, Suite 613

El Toro, CA 92630

(714) 588-8649

[judy@usenix.org](mailto:judy@usenix.org)

**Call for Papers**  
**Workshop on**  
**Large Installation Systems Administration III**  
**September 6-8, 1989**  
**Austin, TX**

In light of increasing attendance at the workshops on Large Installation Systems Administration, plus contributions from various places (academia to standards efforts to commercial development work on system administration tools), the third annual workshop on this subject will again be chaired by Alix Vasilatos in Austin, TX on Thursday and Friday, September 7th and 8th, 1989, preceded by a day of system administration tutorials.

For the first time, a program committee will be reviewing submitted papers on subjects including, but not limited to:

- Automating systems administration chores
- Network management
- Distributed services
- Backup and archiving
- Spooling/Queuing schemes
- Configuration synchronization
- Accounting/Passwd maintenance
- Electronic communication (USENET/News/Notes/Mail)
- Software distribution
- Reliability enhancement

Papers can range in length from “very short” (1-3 pages) to not over 14 pages including all figures, diagrams, etc. Complete papers only, please, even if short. Abstracts and outlines will not be accepted. Include a description of the unique characteristics of the site, an outline of the problem, and a description of the solution (detailed enough that fellow administrators can implement it). Workshop proceedings will be available at the workshop.

The deadline for submissions is **June 30, 1989**. For further details about the workshop, contact:

Alix Vasilatos  
Open Software Foundation  
11 Cambridge Center  
Cambridge, MA 02142  
  
(617) 621-8722  
alix@osf.org

For details about registration, contact the USENIX Conference Office.

# **Call for Participation**

## **Workshop on Experiences with Building Distributed (and Multiprocessor) Systems<sup>†</sup>**

**October 5-6, 1989  
Ft. Lauderdale, FL**

**Goals:** The goal of this workshop is to bring together individuals who have built, are building, or will soon build distributed and multiprocessor systems, especially operating systems. The workshop will feature full presentations, panels, work-in-progress presentations, and possibly tutorials on aspects of building and testing these systems. The workshop will provide a forum for individuals to exchange information on their experiences, both good and bad, in designing, building, and testing their systems. This includes experiences with coding aids, languages, distributed debugging tools, prototyping, reuse of existing software, performance analysis, and lessons learned from use of such systems.

**Submissions:** *Ten* copies of each submission should be mailed to the program committee chair (address below) no later than **1 June 1989**. Submissions are invited on any topics related to the workshop in the form of papers or extended abstracts, although the program committee will give preference to full papers. Furthermore, the committee will give preference to submissions describing experiences with actual systems.

Registration and attendance will be limited.

### **Important Dates**

Paper submissions	1 June 1989
Program Committee decisions	14 July 1989
Camera ready copy due	1 August 1989
Workshop	5-6 October 1989

For Further Information, contact:

*General Chair*  
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<sup>†</sup> Sponsored by The USENIX Association; in association with the NSF / Purdue / Florida Software Engineering Research Center; in cooperation with ACM SIGOPS and SIGSOFT (pending) and IEEE-CS Technical Committee on Distributed Processing (pending).

**Call for Participation**  
**5th USENIX Computer Graphics Workshop**  
**November 16-17, 1989**  
**Doubletree Hotel – Monterey Convention Center**  
**Monterey, CA**

The 5th USENIX Computer Graphics Workshop will be held in Monterey on Thursday and Friday, November 16-17, 1989. The theme of the workshop is “personal graphics.” By this, we mean the use of computer graphics to aid, benefit, or amuse a single person. Generally, personal graphics applications are highly interactive, so that the user has a great deal of control over the result. Furthermore, the graphics is frequently not an end product, but is instead a communication medium between the user and computer. Examples of personal graphics might include desk-top publishing, data visualization programs (e.g., MacSpin), windowing systems, micro-world simulations (Kay’s vivarium?), and “performance” graphics (e.g., video weirdness). It probably does not include ray-tracing, yet another VLSI graphics chip, or fast rendering algorithms. A distinguishing feature is that the user is included as an integral part of the description of the system.

Personal graphics is becoming increasingly important as the cost of high-performance computing gets lower and lower, so that “Joe Public” is exposed to better and faster graphics than was previously possible. You only have to look at the progression from PC to Macintosh to NeXT to see this trend. One question that could be addressed by presentations in this workshop is “How are ‘ordinary people’ going to effectively use computer graphics in their daily lives?”

In addition to traditional full-length papers, we will entertain proposals for more informal short presentations and panel discussions. Submissions for the workshop will be judged on their intrinsic merit, but preference will be given to those which bear closely on the theme.

Extended abstracts (300-700 words) or position papers should be submitted by **July 3, 1989**. Authors will be notified of acceptance by **July 17, 1989**. Materials for inclusion in the proceedings should be submitted by **October 2, 1989**. Submissions may be made electronically or as hard-copy. Electronic submissions should be plain text, *troff* (-ms or -me preferred, do not use -mm), *LaTeX*, or PostScript. Mail electronic submissions to [usenix-graphics@crim.eecs.umich.edu](mailto:usenix-graphics@crim.eecs.umich.edu), or send hard-copy to the workshop chair:

Spencer W. Thomas  
EECS Department  
University of Michigan  
1101 Beal Ave.  
Ann Arbor, MI 48109-2110  
(313) 936-2616



# Call for Papers

## Winter 1990 USENIX Conference

### January 22-26, 1990

### Omni Shoreham

### Washington, DC

Papers are sought in all areas of UNIX-related research and development for the technical program of the 1990 Winter USENIX Conference. Papers which are accepted for the conference will be published in the conference proceedings and shall be presented during the three days of technical sessions at the conference.

Appropriate topics for presentation include, but are not limited to:

New Tools and "Little Languages"

UNIX and AI:

Intelligent Systems

Neural Nets

Ada and UNIX –

Real Experience and Future Expectations

File Systems and Servers

Failsafe and Failsafe File Managers

Hierarchical File Migration

Version Control

Architectures and Compilers

Software Release Systems and Servers

Documentation issues

Distributed Systems and Services

Networking and Security

User Interfaces and

User Interface Management Systems

Experiences and Novel Applications

All submissions will be considered – however, papers detailing new and interesting work will be regarded much more favorably than thinly disguised product announcements or re-runs of previous reports. The Winter 1990 conference is requiring that **extended abstracts** (and *not* full papers, as in previous conferences) be submitted. An extended abstract should describe the nature of the work, summary of results and conclusions, and should be between 1000-2000 words long (two to three typeset pages). Time is scheduled for authors of accepted papers to complete their

submissions; therefore, extended abstracts will only be accepted when it is felt that a complete and worthy paper can be produced by the final due date.

The final paper should include a 100-300 word abstract, a discussion of how the paper relates to other work, illustrative figures (where appropriate), and citations to relevant literature. Only previously unpublished submissions will be considered. Final papers should contain on the order of 8-12 pages of single spaced typeset materials. All final papers must be submitted in a camera-ready format or electronic format (*troff*-ms if possible) – typewritten or dot-matrix output is **not** acceptable as final output. For authors without access to a laser printer or typesetter, appropriate facilities will be provided by the program chair.

Please submit abstracts as soon as possible, and mail one hard-copy and one electronic-copy to the addresses below. The final deadline for receipt of submissions is **August 14, 1989**; abstracts received after this deadline will not be considered. Notification of acceptance or rejection will be made by **September 25, 1989**. Final camera-ready papers are due by **November 17, 1989**.

To submit a paper or request additional information, please contact:

Daniel V. Klein  
Washington USENIX Technical Program  
Software Engineering Institute  
Carnegie Mellon University  
Pittsburgh, PA 15213

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uunet!sei.cmu.edu!wash-usenix

Program committee:

Daniel V. Klein, Chair – Software Engineering Institute, CMU  
Eric P. Allman – International Computer Science Institute  
Pat Caruthers – Aratar  
John Devitofranchesi – University of Illinois, Urbana  
Michelle Dominijanni – Concurrent Computer Corporation  
Daniel Geer – Massachusetts Institute of Technology  
Chet Juszczak – Digital Equipment Corporation  
John R. Mashey – MIPS Computer Systems  
Michael D. O'Dell – Prisma, Incorporated  
Charlie Perkins – IBM, T.J. Watson Research  
Dennis M. Ritchie – AT&T Bell Laboratories  
Susanne Smith – Windsound Consulting  
Alix Vasilatos – Open Software Foundation

Please remember to include your email and postal addresses on any correspondence.

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## **AUUG '89 Conference and Exhibition**

**August 8-11, 1989**  
**Hilton Hotel**  
**Sydney, Australia**

The 1989 Conference and Exhibition of the Australian UNIX systems User Group will be held August 8-11 at the Hilton Hotel in Sydney, Australia. Tutorials will be held on Tuesday, and the conference proper Wednesday to Friday. The Conference theme is

*No one ever got fired for buying UNIX*

The guest speakers will include Dennis Ritchie, James Gosling, and Sunil Das.

Further information may be obtained from Peter Barnes,

uunet!munari!uqcspe.cs.uq.oz!pdb  
pbd@uqcspe.cs.uq.oz

## USENIX C++ Workshop

The USENIX Association will be sponsoring a limited attendance C++ Workshop in 1990. The format will be similar to that of the Santa Fe C++ meeting, but may be three days long.

Jim Waldo of Apollo Computer is the Workshop Chair. If you are interested in discussing the workshop format and/or topics, contact Jim at *waldo@apollo.com*.

A call for papers will appear in *;login:* and on *comp.org.usenix*.

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## Nominating Committee Formed

The USENIX Association will hold elections for the Board of Directors in 1990. A committee has been formed to nominate candidates. The committee members are

Ed Gould, Chair, mt Xinu  
Tom Ferrin, UC San Francisco  
Charlie Sauer, IBM Austin  
Wendy Thrash, Pyramid Technology  
Pat Wilson, University of Virginia  
Elizabeth Zwicky, Ohio State University

The positions on the USENIX Board are

President  
Vice President  
Treasurer  
Secretary  
Member at Large (four positions)

Board members all serve two-year terms. The committee will be making nominations for all offices and at-large positions.

We are soliciting suggestions for nominations. If you suggest someone other than yourself, please be sure the person you suggest concurs or that you clearly tell the committee that they have not agreed.

Suggestions for nominees, and other comments, may be sent to the committee at

*nominate@usenix.org*  
*uunet!usenix!nominate*

– Ed Gould

## The UK UNIX systems User Group

### History of the UKUUG and EUUG

The UK UNIX User Group (UKUUG) was initially formed during the academic year 1976-77. It grew under Alan Mason's Chairmanship (1979-82) with Peter Gray and Alistair Kilgour on the original committee. At this time UNIX in the UK consisted of V5 and V6 sites, and Herriott-Watt's (a Scottish university) V6+.

In 1980, in recognition of the increasing number of non-UK members joining UKUUG, the name was changed to the European UNIX User Group (EUUG), and later a separate National UK Group was formed. In 1982, the authorities (i.e. AT&T) decreed that henceforth the word UNIX was to be used as an adjective and not a noun. Thus, the word systems (the lowercase s is deliberate) had to be inserted into User Groups' titles. The European organisation was re-structured in 1983 to consist of a number of national groups from many European countries.

### Introducing the UKUUG

The UKUUG is a non-profit organisation which exists to provide a body representing the users of UNIX and UNIX-related systems in the United Kingdom. It is unique in catering for the needs of users and being totally independent from specific hardware and software vendors. UKUUG is affiliated with the EUUG. The advantage of this structure is that UKUUG members can accrue the benefits of UK activities, such as permission to participate in UKnet, the UK branch of the world-wide uucp computer network, and attendance at discounted member rates of the bi-annual two-day technical meetings, while receiving the services provided by the EUUG, such as four free copies per annum of EUUGN, the Newsletter, and attendance at EUUG Conferences and Tutorials.

The UKUUG membership is drawn from the information technology, commercial and research/academic sectors in equal proportions. The membership can be found working in software engineering, computer

manufacturing, as end-users, in software houses, universities and research centres. They all share the fact that they are UNIX users, whether they develop kernel modifications, develop applications, are involved in teaching and research, use their system in a turnkey environment, or any other sphere of interest. In order to maintain its independence from software and hardware vendors, the UKUUG is funded entirely by membership subscriptions. Needless to say, all the major suppliers of UNIX and UNIX-related systems are members. There are two categories of membership of UKUUG: institutional and individual.

Members of UKUUG are especially active in the UK, European and American standards bodies such as the British Standards Institution (BSI), the International Standards Organisation (ISO) and the Institute of Electrical and Electronic Engineers (IEEE). They provide significant input to committees involved in creating standards, such as ANSI C, POSIX, SVID and X/OPEN.

UKUUG holds a two-day Technical Meeting twice a year, in the Summer and Winter, at various venues around the country. Recent meetings have been held in Glasgow, London, Manchester, Newcastle and Canterbury. The next meetings will be held in June 1989, with Strathclyde University acting as host, followed in December at Cardiff University.

The purpose of these meetings, which are open to non-members as well as members, is to provide a forum for the dissemination and discussion of developments concerning the UNIX and C programming environments. An international guest speaker is invited to present a paper, in addition to those presented by UKUUG members. Papers are published in advance of the meeting. An attempt is made to keep the entrance fee at a level which just covers the costs of organising and running the meeting. In practice, UKUUG has subsidised the meetings. Members receive the benefit of a discounted entrance fee.

In April 1988, UKUUG acted as host to the EUUG's Spring Conference which was held

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at the Queen Elizabeth II Conference Centre in Parliament Square, London. The Conference entitled "UNIX around the World" was attended by nine present and past members of the Computer Science Research Centre of AT&T Bell Laboratories, including Dennis M. Ritchie, Doug McIlroy, Dave Presotto and Andrew Hume.

The UKUUG will be holding a five day Conference, tutorial and exhibition programme 9-13 July, 1990. Guest speakers include Ken Thompson and Brian Kernighan.

Sunil K. Das, UKUUG Chair

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UNIX USERS MEETING AGENDA

MAY 15, 1974

MERRITT CONFERENCE ROOM - 3RD FLOOR P&S

10:30 START

11:30 BRIEF DESCRIPTION OF THE SEVERAL INSTALLATIONS  
AND THEIR USE OF UNIX

12:00 LUNCH

1:00 KEN THOMPSON SPEAKS

2:00 INTERCHANGE OF UNIX HINTS, PROBLEMS SOLUTIONS, BUGS

3:00 INTERCHANGE OF DEC HINTS, PROBLEMS SOLUTIONS, BUGS

4:00 FREE-FOR-ALL DISCUSSION

?

\*P&S (3+2+2=7)

\*BIO (2)

\*BROOKLYN (4)

U.N.C. (1)

BROOKHAVEN (4)

YALE (1?)

\*GEORGIA TECH (1)

\*WISCONSIN (1)

CUNY (1?)

POLY OF BROOKLYN (1)

NYU (1)

BELL LABS (2)

A COUPLE MORE I FORGOT

THE '\*' ONES HAVE UNIX I THINK

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Reidar Bornholdt kindly supplied this copy of the first UNIX Users Meeting Agenda, which was organized and chaired by Lou Katz.

## Book Review: Learning the vi Editor

by Linda Lamb

(Newton, MA: O'Reilly & Associates, 1988) 144 Pages, \$15.00

*Reviewed by Peter H. Salus*

Open Software Foundation  
peter@osf.org

It is hard to believe than anyone can work on a UNIX system for more than a few moments without invoking *vi*. Whether your site runs System V.x or 4.nBSD, your system has *vi*. And though there are folks who use some version of emacs or the Grand Editor, most of us employ *vi*.

This being true, it is hard for newcomers to adapt to the notion that they will have to learn how to do things by reading Joy/Horton in the manuals (a treat for the uninitiated) or purchase Bolisky's 1984 AT&T handbook (good, but too brief) or buy Hansen's 1986 book (overpriced, but satisfactory). There were also the earlier editions of Lamb's volume in ORA's "Nutshell" series.

I readily admit to having been less than overwhelmed by the first edition of Lamb (early 1986). The second edition (also in 1986) contained minor corrections. The third (summer 1987), was a major revision, much enlarged and containing a useful index by Walter Gallant. The fourth edition, which I have been using for over six months, is an updating of the third.

I am running through the publication history because I think that the ability to adapt and revise and reprint with reasonable alacrity is one of the great advantages of the way that O'Reilly & Associates produce their handbooks.

I went through Lamb's *Learning the vi Editor* myself and then gave it to a new employee (who had never worked on a UNIX

system before). Lamb's book was perfect for the beginning newcomer: shortcomings of the first edition had been filled out and the material was not introduced in a way that would deter the new user.

I have since given it to two other newcomers, with amazing success. Lamb appears to have avoided all the pitfalls of writing at too-advanced a level, assuming knowledge, etc., at the same time that *Learning the vi Editor* is not so elementary that experienced users will find it excruciating.

As someone who uses *vi* for several hours every day, I admit to learning several tricks from Lamb's "Advanced Editing" chapter.

For those who are looking for an introductory book to give to new staff members who have no acquaintance with either screen editing or with UNIX screen editing, this is it: a book on *vi* that is neither designed for the UNIX in-crowd, nor so imbecilic that one is ashamed to use it.

**Brief Note:** If you have someone on your site who has never worked on a UNIX system and who needs a quick how-to, Nutshell has the right booklet. *Learning the UNIX Operating System* by Grace Todino and John Strong (81 pages; \$9.00) can get a newcomer rolling in a single session. It covers logging in and out; files and directories; mail; pipes, filters, backgrounding; and a large number of other topics. It's clear, cheap, and can render a newcomer productive in a few hours.

## Long-Term Calendar of UNIX Events<sup>†</sup>

1989 Jun 12-16	USENIX	Hyatt Regency, Baltimore, MD
1989 Jul 10-12	13th JUS UNIX Symposium	Tokyo, Japan
1989 Jul 10-14	IEEE 1003	San Francisco, CA
1989 Aug 8-11	AUUG Conference	Sydney, Australia
1989 Sep 7-8	* Large Systems Admin. Workshop	Austin Marriott, Austin, TX
1989 Sep 12-13	MALNIX	Kuala Lumpur, Malaysia
1989 Sep 18-22	EUUG	Vienna, Austria
1989 Sep 27-29	Workstation Operating Systems	Pacific Grove, CA
1989 Oct 5-6	* Distributed Systems Workshop	Marriott Marina, Ft. Lauderdale, FL
1989 Oct 16-20	IEEE 1003	Brussels (or Amsterdam)?
1989 Nov 1-3	UNIX Expo	New York, NY
1989 Nov 6-10	DECUS	Anaheim, CA
1989 Nov 9-10	14th JUS UNIX Symposium	Osaka, Japan
1989 Nov 16-17	* Graphics Workshop V	DoubleTree Hotel, Monterey, CA
1989 Dec 5-6	JUS UNIX Fair 89	Tokyo, Japan
1990 Jan 22-26	USENIX	Omni Shoreham, Washington, DC
1990 Jan 23-26	UniForum	Washington Hilton, Washington, DC
1990 Jan 29	IEEE 1003	New Orleans, LA
1990 Feb	UNIX in Government	Ottawa, Ont.
1990 Apr	IEEE 1003	Montreal, Que.
1990 Apr 23-27	EUUG	Munich, Germany (tentative)
1990 May 7-11	DECUS	New Orleans, LA
1990 May	UNIX 8x/etc	/usr/group/cdn; Toronto, Ont.
1990 Jun 11-15	USENIX	Marriott Hotel, Anaheim, CA
1990 Autumn	EUUG	south of France
1991 Jan 21-25	USENIX	Grand Kempinski, Dallas, TX
1991 Jan 22-25	UniForum	Infomart, Dallas, TX
1991 Jun 10-14	USENIX	Opryland, Nashville, TN
1992 Jan 20-24	USENIX	Hilton Square, San Francisco, CA
1992 Jan 21-23	UniForum	Moscone Center, San Francisco, C,
1992 Jun 8-12	USENIX	Marriott, San Antonio, TX
1993 Jan	USENIX	California
1993 Jun 21-25	USENIX	Cincinnati, OH

<sup>†</sup> Partly plagiarized from John S. Quarterman and Alain Williams by PHS.

\* USENIX Workshops

USENIX ASSOCIATION  
BALANCE SHEET  
NOVEMBER 30, 1988  
(Unaudited)

ASSETS

CURRENT ASSETS:

Cash in bank:		
First Interstate Bank	\$262,666	
Mechanics Bank	10,715	
Mechanics Bank, UUNET	18,872	
First Interstate Bank	16	
First Interstate Bank	213,480	
First Interstate Bank,		
Conference account	173,856	
Colorado National Bank:		
Growth Reserve Account	34,770	
Checking account	34,776	\$ 749,151
Marketable securities:		
The Reserve Fund		141,181
Advances		1,300
Prepaid expenses		<u>51,211</u>
Total current assets		942,843

FIXED ASSETS, AT COST	131,556	
Less - accumulated depreciation	<u>(63,058)</u>	68,498

OTHER ASSETS:

Note receivable, UUNET		<u>100,012</u>
		<u>\$1,111,353</u>

LIABILITIES AND FUND BALANCE

CURRENT LIABILITIES:

Accrued expenses	\$ 2,813
Payroll taxes payable	3,355
Deferred revenue	<u>68,735</u>
Total current liabilities	74,903

FUND BALANCE:

Balance, December 1, 1987	\$501,203	
Revenue over expenses for the		
year ended November 30, 1988	<u>535,247</u>	<u>1,036,450</u>
		<u>\$1,111,353</u>

See accompanying notes to financial statements.

ELLIOTT D. BUCHDRUKER, C.P.A.



USENIX ASSOCIATION  
STATEMENT OF REVENUE AND EXPENSES  
FOR THE YEAR ENDED NOVEMBER 30, 1988  
(Unaudited)

REVENUE:		
Membership fees		\$ 201,498
Conference and workshop income (Exhibit A)		957,310
Proceedings		50,653
Manuals and tapes		34,512
Dividend income		13,097
Interest income		30,582
UUNET		514,864
Gain (loss) on sale of stock		(478)
Miscellaneous		<u>22,937</u>
Total revenue		<u>1,824,975</u>
EXPENSES:		
Program services:		
UUNET	\$429,259	
Tape service	36,869	
Projects	11,851	
Scholarships	<u>7,500</u>	485,479
Supporting services:		
Salaries	205,577	
Payroll taxes	24,063	
Fringe benefits	30,856	
Consulting and contract labor	27,299	
Computer equipment maintenance and repair	29,409	
Meetings and travel	37,937	
Refunds	7,477	
Postage and shipping	40,547	
Depreciation	23,118	
Occupancy	52,808	
Advertising and promotion	4,738	
Office equipment rental and maintenance	5,211	
Printing and typesetting	77,584	
Supplies	18,936	
Legal and accounting	23,560	
Insurance bonds	10,145	
Taxes and licenses	2,104	
Bank charges	237	
Manuals	23,622	
Utilities	4,947	
Public relations	24,100	
Facesaver expenses	16,531	
Telephone	30,727	
Dues and subscriptions	1,033	
Journal	56,369	
Temporary help	3,648	
Miscellaneous	<u>21,666</u>	<u>804,249</u>
Total expenses		<u>1,289,728</u>
REVENUE OVER EXPENSES		<u>\$ 535,247</u>

See accompanying notes to financial statements.

ELLIOTT D. BUCHDRUKER, C.P.A.

## An Update on UNIX Standards Activities

### Overview following Ft. Lauderdale meeting February 20, 1989

*Shane P. McCarron, NAPS International*

This marks the fifth in a series of articles about the UNIX Standards community. Before we get too far here, I would like to apologize for the lateness of this particular report. While it should have been out in mid-February, it is now late March and I am just completing the editing. Hopefully this type of delay will not be seen again.

The big news this quarter is that the ANSI C Standard X3.159-1989 has been approved by the X3 Secretariat. This means that the X3 people are satisfied with the technical merit of the standard, as well as with the procedures that were followed in completing it. Once it has been formally reviewed by ANSI, we will have an American National standard for the C language. This is good and bad. The C Language standard has a few glaring flaws that make it all but impossible to write a truly portable application. I am certain that it is possible to write a mostly portable application with little difficulty, but that wasn't really the goal of the standard. More on this later.

This quarter we have reports from a number of committees. They are in various states of repair, with varying levels of detail. I have received little feedback from you about how much detail should be included in the reports. Consequently, it has been left up to the USENIX Watchdog Committee contacts to generate as much or as little material as they see fit. If you have comments on this, please send them to me or directly to the contact person whose report you are commenting on.

As always, we are looking for a few good people to represent us in standards committees. If you would like to work with us in trying to bring the world of standards to light, please contact the Standards Watchdog Committee's Volunteer Coordinator, Marc Teitelbaum (415-643-6448).

[Shane has a new job and a replacement is being sought; interested parties should write John Quarterman at [jsq@usenix.org](mailto:jsq@usenix.org) -EY]

#### 1003.0 - POSIX Guide

The following report is printed exactly as it was sent to me by our contact in 1003.0. I find his unedited observations to be very enlightening.

This past Jan 89 meeting for IEEE 1003.0 group is the fourth since the group's inception. The first took place in March 1988. In summary, it has been a bit of a roller coaster ride. We jumped into the fray back in March with high expectations and with the strong intentions of having taken bold steps by now. Upon coming up to our one year mark, it is clear to me that we have been (and still are) experiencing a right of passage. Specifically, we have gone through the growing pains that every volunteer organization does when attempting to take bold strides, only to stumble on such things as consensus, priorities, level of detail, and parameters.

It also clear to me that this was inevitable. Given the state of affairs within this whole realm of open systems, i.e. contention and conflict, and given the goal of our attempting to address this realm (to which no accredited body has addressed itself to date), conflict and a bit of thrashing around were, in retrospect, to be expected. The group is reaching the point where a significant amount of synergy is developing. I would define that as everyone knowing what to expect from those who are the most vocal AND each person knowing when to limit and/or categorize his/her discussion.

We struggled with procedural issues in order to ensure that anarchy did not reign while concurrently ensuring that creativity was not stifled. We are beginning to reach this goal.

We experienced the classic problem of everyone during a meeting setting high and lofty goals only for things to fall through the cracks when they returned to their jobs and saw other pressing priorities awaiting them. Goals set during this past meeting were more pragmatic and better thought out. In addition, the group's leadership is taking a more active role to ensure that friendly reminders and follow ups occur. (I thought I heard someone say that their legs might be broken if action items were missed but I was outside getting a cup of tea at the time.)

One very key and contentious issue which was discussed and tabled was that of changing our PAR to say that we will develop a standard instead of a guide. This kind of change has far-reaching ramifications and, in my strong opinion, is unwise and unneeded. Some felt it was necessary to put some "teeth" into our end-product by making it a standard. So much attention is being paid to our effort now that a basic list of priority standards would garner significant consumption. And we are certainly proceeding further than that.

Overall, the group is coming together and a second draft version is in the works. (Draft 1 was, for the most part, an outline). The goal for our April meeting is to have a draft that the group feels is mature enough to begin invoking the formal proposal process for future changes. We'll have to wait and see what these next few months yield.

The USENIX Standards Watchdog Committee contact for 1003.0 is Kevin Lewis. He can be reached at:

klewis@gucci.dec.com  
+1 (202) 383-5633

#### 1003.4 – Real Time Extensions to POSIX

In the previous report, I reported that the Real-Time committee was prepared to start mock ballot procedures after the January meeting. For those of you who have just tuned in, a mock ballot is a review process where IEEE formal ballot rules are used, but the ballot is not conducted by the IEEE Standards Office. It is used by some committees as a means of testing to see whether their draft is ready for prime time. Anyway, it appears that there

were a few problems that came up at the last minute, and the anticipated mock ballot did not happen.

The main reason for this is that two important proposals have not reached full consensus within the committee – Realtime Files and Process Memory Locking. The working group felt that these were a little too rough for a formal review, so an extra three months was taken to get them into better condition. The April meeting should produce a draft for mock ballot.

Those two issues that prevented the draft from going to mock ballot also proved to be the most controversial yet. There was a heated debate about the realtime files proposal because some people wanted parts of the proposal to be mandatory for all implementations. The proposal would require all conforming implementations to implement an Extent Based File System (among the attributes of an EBFS is the ability to allocate a file in physically contiguous chunks). This issue went around the table several times but no final resolution was reached. The next meeting will (hopefully) complete these debates.

The memory locking proposal was reworked to allow an implementation that does not "stack" user requests. In the original proposal, the user was allowed to stack locks. The system was required to maintain information about each byte and the number of times the user locked that byte in memory. The draft 6 proposal will be much simpler than the one released with draft 5.

The committee also examined what future topics should be covered. First on the list is a threads (or light weight process) mechanism. The realtime committee will be addressing this issue directly after the first draft is finished (or before if some working group members get their way). There are currently a number of unique interfaces to threads, and selecting one for a standard should prove to be a major challenge.

The USENIX Standards Watchdog Committee contact for 1003.4 is Sol Kavy. He can be reached at:

sol@hpda.hp.com  
 hpda!sol  
 +1 (408) 477-6395

### 1003.6 – Security Extensions to POSIX

The security working group is currently working on a number of topics in parallel – Auditing, Discretionary Access Controls (DAC), Mandatory Access Controls (MAC), and Privileges. As these topics have been described in detail in previous installments, I won't do it again. Instead, here is a brief summary of topics of interest being discussed in those sub-committees:

*MACs:* The group decided to accept one proposal before them as a baseline. This will help them to decide on their exact scope of operation and also to decide on their goals. This baseline proposal has not solved even a small percentage of the problems facing this committee. Things like information label mechanisms, data transport, text label format, label constraints, and security for public/shared directories were too abstract at this time, the group decided to ask for white papers to talk about them at the April meeting.

*AUDIT:* This group has embraced a proposal as a base. This proposal, in conjunction with a proposal from X/Open, will probably be the primary source in this area.

*DAC:* This group was finally able to resolve some of the issues that have been in dispute since its creation. In particular, the group was able to agree on: The representation of an Access Control List (ACL), Ordering, Default ACLs, and most importantly the issue of how ACLs are to be used in the system. ACLs will be an additional security mechanism, which must be enabled by explicit user action. This satisfies the requirements of the 1003.1 standard, which had left room for just such a mechanism by leaving some weasel-wording in the definition of File Group Class. The specific mechanism will be that the permissions available to users (or groups) listed in an ACL will be a subset of those available using the traditional group permissions of the file.

In addition, the inheritance of ACLs was discussed. It appears as if the group will agree

that the ACL for a directory will propagate to any sub-directories that are created. However, this is still an issue and will be debated at the April meeting.

In addition, the group agreed that there will be routines in the standard for manipulating each type of ACL, and that named or shared ACLs will not be in the standard.

*PRIVILEGES:* The principle of least privileges requires that each subject in a system be granted the most restrictive set of privileges needed for performance of authorized tasks. The principle of Least Privilege will also include the concept that each privilege is available for the minimum scope of execution required to perform the task for which it is needed.

The purpose of privileges is to assure the authorized and restricted use of a service. Security relevant code can be bracketed and the privileges may be enabled only during execution of that part of a program.

Issues that need to be addressed by this group include:

- To what degree can privileges be segmented to allow control over individual privileged actions?
- How can a designer of a privilege propagation mechanism assure compliance with the principle of least privilege?
- How can user access to privileged operations be limited in accordance with the principle of least privilege?
- What control interfaces are necessary to allow privilege mechanism?

The group has agreed that no privilege should grant access to more than a single set of related operations. The group also agreed that the propagation of a privilege from one "subject" (process) to another should be strictly controlled. Because traditional implementations propagate privilege based on the effective user ID of a process, any secure implementation will have to permit this behavior. However, to permit for more secure software being developed in the future, it is necessary to provide some primitives that will

permit a parent process to restrict which privileges are propagated to its children.

The standard will be defining a set of interfaces for accessing privileged operations. These interfaces will allow for: Reducing the level of privileges, setting, creating, or adding privileges, acquiring privileges, testing for privileges, requesting a privilege type, setting privilege propagation, requesting a set of maximal privileges, determining the set of privileges currently enabled, determining the success or failure of privilege accumulation, and creating of privileges not in the current set.

The scope of this committee is to define extensions to the POSIX interface which support a privilege mechanism capable of enforcing a "Least Privilege" security policy, and a minimum set of privileges which are necessary to support such a policy in a portable applications environment.

The USENIX Standards Watchdog Committee contact for this group is Anna Maria de Alvare. She can be reached at:

annamaria@lll-icc.llnl.gov  
uunet!lll-icc.llnl.gov!annamaria  
+1 (415) 422-7007

### 1003.7 - System Administration

At the first official meeting of the 1003.7 working group, John Quarterman presented a USENIX concern about the direction that the working group seemed to be taking. USENIX was concerned about the "single machine" model which was being suggested by the working group for designing tools and utilities. USENIX felt that if a single machine model were used, it would be difficult or impossible to extend the utilities and interfaces adopted by the committee to a networked system. However, if the working group chose a model in which a machine was assumed to be part of a tightly coupled network, then a single stand-alone machine could be a simple special case of a networked machine.

After some deliberation, the working group adopted the USENIX model of a machine in a tightly coupled network. This has some rather far-reaching implications on the direction of the working group, as it is a

different approach than that taken by 1003.1 and 1003.2. It will also mean that the group will be relying heavily on work and expertise from 1003.8 (networking). It also means that some of the concepts, such as a filesystem, which we thought we had a definition for, suddenly become much more complex.

In addition, it means that the working group will be reviewing several documents which reflect prior art in the area of networking, such as the CMIP, ASN.1 and SMNP networking protocols. These protocols will be reviewed at the next meeting.

A number of areas are affected by networking implications. Some of these are difficult to resolve, since things like device management, print spooling and performance monitoring, to name a few, may want to cross a network. The working group is still undecided about the direction which is going to be taken here. The two obvious options are to provide for centralized administration of a network of machines, allocating and deallocating devices over the network from central spot; or a decentralized model in which each machine is responsible for administering the devices connected to it. This will be reviewed at the next meeting.

Although this was our first meeting, a substantial amount of work was done by the working group. The first two days were spent reviewing global issues to the working group, such as determining direction, reviewing IEEE procedures, discussion of previous informal meetings of the system administration group and discussion of which model to choose. Once all of this was done, the working group split up into small groups and focused on the areas which needed to be addressed. Specifically, the areas being addressed are:

- Process Management
- Spooling Management
- System Startup/Shutdown
- Communication Management
- File Systems Management
- Performance Monitoring
- System Accounting
- Device and Media Management
- Software Management
- User Administration
- System Monitoring

## Miscellaneous Introduction

Some items of note:

*Spooling Management:* The System V spooling mechanism was chosen as a model for the working group. This model has been adopted by X/Open. It was recognized by the working group that the current System V *lp* interface does not adequately support networking. The working group felt that it could be extended to support networking relatively easily.

*Communications Management:* The committee will review the CMIP, ASN.1 and SMNP protocols to determine if and how these protocols may fit into the work that the working group is doing. In addition, UUCP managed to rear its (useful but ugly) head here. Even though 1003.2 has parts of UUCP within its scope, this committee may need to address the issues of UUCP administration.

*File System Management:* The biggest problem here will be defining what a file system really is. 1003.7 will be looking to 1003.8 for help in defining the concept. However, the group has realized that even without a definition it will be useful to be able to mount, unmount and check file systems.

*Performance Monitoring:* The performance monitoring group has followed the lead of the /usr/group performance monitoring committee. This is hardly surprising considering that the

technical reviewer for this section is the chair of the /usr/group performance monitoring committee. Their model seems reasonable, and in fact represents prior work in this area.

*System Installation:* An inordinate amount of time was spent drafting an objection to the AIU facility described in 1003.2. The object will be submitted to 1003.2 as an objection from the 1003.7 working group. There are a number of concerns about the application installation which many in the working group and outside of it feel are not able to be addressed by a rigidly-defined installation utility. Work progresses in spite of these concerns.

The working group submitted a substantial amount of work to the technical editors. The editors have now collated all of this information and produced a draft that will be discussed at the April meeting. Although this document may not be suitable for release, it will at least provide a framework for development for the working group.

Obviously, the work has just begun, but so far a fair amount of progress has been made, and hopefully, more progress will be made in future meetings.

The USENIX Standards Watchdog Committee contact on 1003.7 is Mark Colburn. He can be reached at:

mark@jhereg.mn.org  
(612) 224-9108

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## 2.10.1BSD Release Available

The second release of 2.10BSD is finally available! It has been designated 2.10.1. Although the changes are fairly simple to describe, they cover large portions of the distribution. Most will not be visible to either users or administrators; specifically, no recompilation is necessary. Administrators should be aware that the 4.3BSD disk quota system is now available. Due to address space considerations, however, it is expensive to run. Also, the source for the on-line manual pages has been rearranged as per the 4.3BSD-Tahoe release.

The major change, and the reason for the second release, is an extensive reworking of the kernel to move the networking into supervisor space. This move eliminated most, if not all, of the instabilities seen in the original networking provided with 2.10BSD; it also doubled the speed of, for example, file transfer. As encouragement to sites that encountered difficulties in using the networking in the first release, or encounter difficulties in this release, we have beta sites that have been running for months without crashing, as well as sites with fifty nodes. We are, however, still suspicious of the DEQNA driver...

In application land, many missing pieces of the 4BSD distribution have been added, most notably the FORTRAN compiler and library and the line printer sub-system. Many other programs have had minor (and not-so-minor) fixes applied.

Keith Bostic  
Casey Leedom

Because the changes to the kernel are major, no "upgrade" tape will be available. 2.10.1 BSD is only available as source, to appropriate licensees of V7, System III, System V, or 2.9BSD. The cost is \$200, prepaid.

The release consists of two 2400 foot, 1600 BPI tapes (approximately 80Mb) and approximately 100 pages of documentation. If you require 800 BPI tapes, please contact USENIX for more information.

If you have questions about the distribution of the release, please contact USENIX at:

2.10BSD  
USENIX Association  
2560 Ninth Street, Suite 215  
Berkeley, CA 94710  
  
+1 415 528-8649  
office@usenix.org

If you have technical questions about the release, please contact Keith Bostic at:

{ucbvax,seismo}!keith  
keith@okeeffe.berkeley.edu  
  
+1 415 642-4948

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**NOTE:** There are a few copies of 2.9BSD available. If you do not have split I&D and want to run UNIX on your PDP-11/x, write the USENIX office.

## Final Printing of 4.3BSD Manuals

The USENIX Association offers all members of the Association the opportunity to purchase 4.3BSD manuals.<sup>†</sup>

The 4.3BSD manual sets are significantly different from the 4.2BSD edition. Changes include many additional documents, better quality of reproductions, as well as a new and extensive index. All manuals are printed in a photo-reduced 6"x9" format with individually colored and labeled plastic "GBC" bindings. All documents and manual pages have been freshly typeset and all manuals have "bleed tabs" and page headers and numbers to aid in the location of individual documents and manual sections.

A new Master Index has been created. It contains cross-references to all documents and manual pages contained within the other six volumes. The index was prepared with the aid of an "intelligent" automated indexing program from Thinking Machines Corp. along

with considerable human intervention from Mark Seiden. Key words, phrases and concepts are referenced by abbreviated document name and page number.

While two of the manual sets contain three separate volumes, you may only order complete sets.

The costs shown below do not include applicable taxes or handling and shipping from the printer in New Jersey, which will depend on the quantity ordered and the distance shipped. Those charges will be billed by the printer (Howard Press).

Manuals are available now. To order, return a completed "4.3BSD Manual Reproduction Authorization and Order Form" to the USENIX office along with a check or purchase order for the cost of the manuals. You **must** be a USENIX Association member.

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Programmer's Reference Manual	
Programmer's Supplementary Documents, Volume 1	
Programmer's Supplementary Documents, Volume 2	
System Manager's Manual (1 volume)	\$10.00

\* Not including postage and handling or applicable taxes.

<sup>†</sup> Tom Ferrin of the University of California at San Francisco, a former member of the Board of Directors of the USENIX Association, has overseen the production of the 4.2 and 4.3BSD manuals.

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**CA - Los Angeles:** the Los Angeles UNIX Group meets on the 3<sup>rd</sup> Thursday of each month in Redondo Beach.

Drew Bullard (213) 535-1980  
ucbvax!trwrbl!bullard

Marc Ries (213) 535-1980  
{decvax,sdcrcdf}!trwrbl!ries

**CO - Boulder:** the Front Range UNIX Users Group meets monthly at different sites.

Steve Gaede (303) 938-2985  
NBI, Inc.  
P.O. Box 9001  
Boulder, CO 80301  
{boulder,hao}!nbires!gaede

**FL - Coral Springs:**

S. Shaw McQuinn (305) 344-8686  
8557 W. Sample Road  
Coral Springs, FL 33065

**FL - Melbourne:** the Space Coast UNIX Users Group meets at 8pm on the 3<sup>rd</sup> Wednesday of each month at the Florida Institute of Technology.

Bill Davis (407) 242-4449  
bill@ccd.harris.com

**FL - Orlando:** the Central Florida UNIX Users Group meets the 3<sup>rd</sup> Thursday of each month.

Mike Geldner (305) 862-0949  
codas!sunfla!mike

Ben Goldfarb (305) 275-2790  
goldfarb@hcx9.ucf.edu

Mikel Manitus (305) 869-2462  
(codas,attmail)!mikel

**FL - Tampa Bay:** the Tampa UNIX Users Group meets the 1<sup>st</sup> Thursday of each month in Largo.

Bill Hargen (813) 530-8655  
uunet!pdn!hargen

George W. Leach (813) 530-2376  
uunet!pdn!reggie

**GA - Atlanta:** meets on the 1<sup>st</sup> Monday of each month in White Hall, Emory University.

Atlanta UNIX Users Group  
P.O. Box 12241  
Atlanta, GA 30355-2241

Marc Merlin (404) 442-4772  
Mark Landry (404) 365-8108

**MI - Detroit/Ann Arbor:** The SouthEastern Michigan Sun Local Users Group meets jointly with the Nameless UNIX Group on the 2<sup>nd</sup> Thursday of each month in Ann Arbor.

Steve Simmons home: (313) 426-8981  
scs@lokkur.dexter.mi.us office: (313) 769-4086

K. Richard McGill  
rich@sendai.ann-arbor.mi.us

Bill Bulley  
web@applga.uucp

**MI - Detroit/Ann Arbor:** dinner meetings the 1<sup>st</sup> Wednesday of each month.

Linda Mason (313) 855-4220  
michigan!usr/group  
P.O. Box 189602  
Farmington Hills, MI 48018-9602

**MN - Minnetonka:** meets the 1<sup>st</sup> Wednesday of each month.

UNIX Users of Minnesota  
545 Ashland Avenue #3  
St. Paul, MN 55102

Scott Anderson (612) 688-0089  
scott@questar.mn.org

;login: 14:3

**MO - St. Louis:**

St. Louis UNIX Users Group  
Plus Five Computer Services  
765 Westwood, 10A  
Clayton, MO 63105

Eric Kiebler (314) 725-9492  
plus5!sluug

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**NE - Omaha:** meets on the 2<sup>nd</sup> Thursday of each month.

/usr/group nebraska  
P.O. Box 44112  
Omaha, NE 68144

Kent Landfield (402) 291-8300  
kent@ugn.uucp

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**New England - Northern:** meets monthly at different sites.

Emily Bryant (603) 646-2999  
Kiewit Computation Center  
Dartmouth College  
Hanover, NH 03755

David Marston (603) 883-3556  
Daniel Webster College  
University Drive  
Nashua, NH 03063

decvax!dartvax!nneuug-contact

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**NJ - Princeton:** the Princeton UNIX Users Group meets monthly.

Pat Parseghian (609) 452-6261  
Dept. of Computer Science  
Princeton University  
Princeton, NJ 08544  
pep@Princeton.EDU

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**NY - New York City:**

Unigroup of New York  
G.P.O. Box 1931  
New York, NY 10116

Ed Taylor (212) 513-7777  
{attunix,philabs}!pencom!taylor

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**New Zealand:**

New Zealand UNIX Systems User Group  
P.O. Box 13056  
University of Waikato  
Hamilton, New Zealand

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**OK - Tulsa:**

Pete Rourke  
\$USR  
7340 East 25<sup>th</sup> Place  
Tulsa, OK 74129

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**PA - Philadelphia:** the UNIX SIG of the Philadelphia Area Computer Society (PACS) meets the morning of the 3<sup>rd</sup> Saturday of each month at the Holroyd Science Building, LaSalle University.

G. Baun, UNIX SIG  
c/o PACS  
Box 312  
La Salle University  
Philadelphia, PA 19141

rutgers!{bpa,cbmvax}!  
temvax!pacsbb!{gbaun,whutchi}

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**TX - Dallas/Fort Worth:**

Dallas/Fort Worth UNIX Users Group  
Seny Systems, Inc.  
5327 N. Central, #320  
Dallas, TX 75205

Jim Hummel (214) 522-2324

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**TX - San Antonio:** the San Antonio UNIX Users (SATUU) meets the 3<sup>rd</sup> Thursday of each month.

Jeff Mason (512) 494-9336  
Hewlett Packard  
14100 San Pedro  
San Antonio, TX 78232  
gatech!petro!hpsatb!jeff

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**WA - Seattle:** meets monthly.

Bill Campbell (206) 232-4164  
Seattle UNIX Group Membership Information  
6641 East Mercer Way  
Mercer Island, WA 98040  
uw-beaver!tikal!camco!bill

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**Washington, D.C.:** meets the 1<sup>st</sup> Tuesday of each month.

Washington Area UNIX Users Group  
2070 Chain Bridge Road, Suite 333  
Vienna, VA 22180

Samuel Samalin (703) 448-1908

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